PRINCIPAL OFFICES:
1234 TIMBERLANE ROAD
TALLAHASSEE, FLORIDA 32312
904-893-8600
FAX 904-668-2731

EX PARTE OR LATE FILED

FCC MAIL ROOM

FEB 19 1997

RECEIVED

ECONOMIC RESEARCH
AND ANALYSIS

Ben Johnson
Associates, Inc

February 14, 1997

William F. Caton
Acting Secretary
1919 M Street, N.W., Room 222
Federal Communications Commission
Washington, D.C. 20554

Re: Ex Parte
CC Docket No. 96-45

Dear Mr. Caton:

On February 13, 1997 at the request of the FCC staff, I met with the following FCC staff members: David Krech, Bryan Clopton, Emily Hoffnar, Robert Loube, and William Sharkey, along with the following staff members from other jurisdictions: Charles Bolle (South Dakota), Sandra Makeeff (Iowa), Barry Payne (Indiana), Paul Pederson (Missouri), Phil McClelland (Pennsylvania), Brian Roberts (California), David Dowds (Florida), Tom Wilson (Washington) and Mark Scanlan (European Commission).

The purpose of the meeting was to discuss our Telecom Economic Cost Model, and related issues concerning the Universal Service Fund. I have enclosed three documents which I distributed during the meeting.

Please associate this letter and enclosures with the record in the above-mentioned docket.

Sincerely,

Ben Johnson, Ph.D.

xc: CC 96-45 Service List

1227 EL PELAR DRIVE
BOISE, IDAHO 83702
208-342-1700
FAX 208-384-1511

ELECTRONIC MAIL:
bja@microeconomics.com

VISIT OUR WEB SITE:
http://www.microeconomics.com

No. of Copies rec'd 0+2
List ABCDE

Presentation of Ben Johnson, Ph.D.
To the FCC/State staff of the Universal Service Joint Board
Washington, D.C. 2/13/97

1. **Attributes of the Telecom Economic Cost Model**
   a. Estimates 5 types of economic costs [LRAC, TSLRIC, TELRIC, LMRCS, LRMCE]
   b. Able to vary market share in detail
   c. Completely 'open' model--most organized, best tracing capability
   d. Able to adjust inputs for individual wire centers or groups of wire centers
   e. Reports costs for two density zones within each wire center
   f. Most detailed inputs, most sophisticated cost modeling in some key areas
      i. Switch costs
      ii. Fiber/copper tradeoffs
      iii. Fiber electronic costs
      iv. Cable material/engineering/installation costs
      v. Structure material/engineering/installation costs

2. **Latest improvements to the Telecom Economic Cost Model**
   a. More detailed modeling of buried and underground installations--leapfrog past other models (e.g. trenching depths, special equipment loading factor)
   b. Allow user to specify different utilization factors for feeder, feeder/distribution, and distribution cable (by wire center, by density zone)
   c. More detailed modeling of fiber electronics--leapfrog past other models
   d. User can specify maximum copper length
   e. Changed a few default inputs

3. **Considerations in choosing a model**
   a. Ease of use
   b. Ease of auditing/verification
   c. Flexibility/adaptability
   d. Ability to refine/improve accuracy of cost estimates
   e. Ability to adapt to unique circumstances of individual companies, states--especially in high cost/rural areas
   f. Resources and capabilities of model developer/sponsor
   g. Vested interest/biases of model developer/sponsor

Proxy Cost Model Comparison

	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Hardware/Software Requirements			
Able to run on typical PC with standard hardware and software	Yes	Yes	Yes
Able to operate without installation of special program	Yes	Yes	**No**
Able to estimate costs without "running" the model	**Yes**	No	No
Flexibility--Types of Cost That Can Be Estimated			
Able to estimate Long Run Average Cost (LRAC)	Yes	Yes	Yes
Combined Residence and Business Network	Yes	Yes	Yes
Stand Alone Residence Network	**Yes**	No	No
Stand Alone Business Network	**Yes**	No	No
Able to estimate Total Service Long Run Incremental Cost (TSLRIC)	**Yes**	No	No
Residence service added/removed to/from stand alone business network	**Yes**	No	No
Business service added/removed to/from stand alone residence network	**Yes**	No	No
Able to estimate Total Element Long Run Incremental Cost (TELRIC)	Yes	**No**	Yes
NID	Yes	**No**	Yes
Drop/Building Cable	Yes	**No**	Yes
Feeder/Distribution	Yes	**No**	Yes
Switching	Yes	**No**	Yes
Trunking	No	No	**Yes**
Able to estimate Long Run Marginal Cost of a Service (LRMCS)	**Yes**	No	No
Residence Local Service	**Yes**	No	No
Business Local Service	**Yes**	No	No

	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Able to estimate Long Run Marginal Cost of an Element (LRMCE)	**Yes**	No	No
NID	**Yes**	No	No
Drop/Building Cable	**Yes**	No	No
Feeder/Distribution	**Yes**	No	No
Switching	**Yes**	No	No
Trunking	No	No	No
Flexibility--Geographic Units of Analysis			
Able to estimate costs for individual wire centers	Yes	Yes	Yes
Able to estimate costs for zones within individual wire centers	**Yes**	No	No
Able to estimate costs for individual CBG's	**No**	Yes	Yes
Able to use LEC engineering data concerning loop lengths	**Yes**	No	No
Able to use LEC engineering data concerning loop counts	**Yes**	No	No
Able to model hypothetical (user defined) wire centers	**Yes**	No	No
Flexibility--Carrier Market Share			
Able to specify carrier's share of overall market	Yes	Yes	**No**
Able to separately specify residence and business	**Yes**	No	No
Able to separately specify zones within individual wire centers	**Yes**	No	No
Accessibility of Inputs, Outputs and Algorithms			
Able to see all costing algorithms	Yes	Yes	Yes
Able to use Excel auditing tools	Yes	Yes	Yes
Able to trace between algorithms	Yes	Yes	Yes
Able to trace forward from inputs to algorithms	Yes	Yes	**No**
Able to trace backward from outputs to algorithms	Yes	Yes	**No**
Written explanation of every algorithm	No	**Yes**	No

	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Customer Mix			
Able to specify mix of Residential and Business customers	**Yes**	No	No
Able to specify mix of single and multi-line customers	**Yes**	No	No
Calling Volumes			
Able to specify usage characteristics	Yes	**No**	Yes
Able to separately specify calls and minutes	Yes	**No**	Yes
Able to separately specify residence and business	Yes	**No**	Yes
Switching Investment			
Able to separately specify Traffic sensitive investment	Yes	**No**	Yes
Able to specify investment related to call setup	**Yes**	No	No
Able to specify investment related to minutes of use	**Yes**	No	No
Able to specify investment related to tandem switching	Yes	**No?**	Yes
Able to separately specify Non-Traffic sensitive investment	Yes	**No?**	Yes
Able to specify investment for minimum size switch	Yes	Yes	Yes?
Able to specify investment related to number of lines	Yes	Yes	Yes?
Interoffice Trunking			
Able to model investment in interoffice trunks	Yes	**No?**	Yes
Able to model individual interoffice routes	No	No	No

	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Aerial Cable Investment			
Able to specify pole sharing percentage	Yes	Yes	Yes
Able to specify investment in poles	Yes	Yes	Yes
Able to specify spacing of poles	Yes	Yes	Yes
Able to specify material cost per pole	Yes	**No?**	Yes
Able to specify engineering cost per pole	**Yes**	No	No
Able to specify installation cost per pole	Yes	Yes	Yes
Able to specify impact of difficult soil conditions	Yes	Yes	Yes
Able to specify investment in cable	Yes	Yes	Yes
Able to specify material costs	**Yes**	No	No
Able to specify engineering costs	**Yes**	No	No
Able to specify installation costs	**Yes**	No	No?
Underground Cable Investment			
Able to specify structure sharing percentage	Yes	**No**	Yes
Able to specify investment in underground structures	Yes	Yes	Yes
Able to specify spacing of manholes	Yes	Yes	Yes
Able to specify material cost per manhole	Yes	Yes	Yes
Able to specify engineering cost per manhole	**Yes**	No	No
Able to specify installation cost per manhole	Yes	Yes	Yes
Able to specify impact of large cable sizes	**Yes**	No?	No
Able to specify investment in underground conduit	Yes	Yes	Yes
Able to specify material cost per foot	Yes	Yes	Yes
Able to specify engineering cost per foot	**Yes**	No	No
Able to specify installation cost per foot	Yes	Yes	Yes
Able to specify impact of large cable sizes	**Yes**	No?	No

	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Able to specify plowing/trenching depth	Yes	Yes	Yes
Able to separately specify Feeder and Distribution	**Yes**	No	No
Able to separately specify copper and fiber	Yes	Yes	**No**
Able to specify impact of difficult plowing/trenching conditions	Yes	Yes	Yes
Able to specify impact of difficult soil conditions	Yes	Yes	Yes
Able to specify impact of man-made obstacles	Yes	Yes	**No**
Able to specify impact of high ground water table	Yes	Yes	**No**
Able to specify cost of sod replacement	Yes	Yes	**No**
Able to specify investment in cable	Yes	Yes	Yes
Able to specify material costs	Yes	**No**	Yes?
Able to specify engineering costs	**Yes**	No	No
Able to specify installation costs	Yes	**No**	Yes?
Buried Cable Investment			
Able to specify trench sharing percentage	Yes	**No**	Yes
Able to specify plowing/trenching depth	Yes	Yes	**No**
Able to separately specify Feeder and Distribution	**Yes**	No	No
Able to separately specify copper and fiber	Yes	Yes	**No**
Able to specify impact of difficult plowing/trenching conditions	Yes	Yes	Yes
Able to specify impact of difficult soil conditions	Yes	**No**	Yes
Able to specify impact of man-made obstacles	Yes	Yes	**No**
Able to specify impact of high ground water table	Yes	Yes	**No**
Able to specify cost of sod replacement	Yes	Yes	**No**
Able to specify investment in cable	Yes	Yes	Yes
Able to specify material costs	Yes	**No**	Yes?
Able to specify engineering costs	**Yes**	No	No
Able to specify installation costs	Yes	**No**	Yes?

	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Copper/Fiber Capabilities			
Able to model both copper and fiber technology	Yes	Yes	Yes
Able to specify all-copper network	**Yes**	No	No
Able to specify maximum copper distribution length	Yes	Yes	Yes
Able to specify minimum fiber length	Yes	Yes	Yes
Able to specify minimum lines served by each remote electronic location	**Yes**	No	No
Able to specify amount of fiber redundancy/safety reserve	Yes	Yes	Yes
Able to model remote fiber electronic investment	Yes	Yes	Yes
Able to specify investment for min. size installation	Yes	Yes	Yes
Able to specify investment related to number of lines	Yes	Yes	Yes
Able to separately specify engineering costs	**Yes**	No	No
Able to separately specify installation costs	**Yes**	No	No
Able to model central office fiber electronic investment	Yes	Yes	Yes
Able to specify investment required for minimum size installation	Yes	Yes	Yes
Able to specify investment related to number of lines	Yes	Yes	Yes
Able to separately specify engineering costs	**Yes**	No	No
Able to separately specify installation costs	**Yes**	No	No
Customer Premises Termination			
Able to model drop wire/building cable investment	Yes	Yes	Yes
Able to separately model residence and business	**Yes**	No	No
Able to model remote terminal investment	Yes	Yes	Yes
Able to separately model residence and business	Yes	**No**	Yes?
Able to model network interface device (NID) investment	Yes	Yes	Yes
Able to separately model residence and business	Yes	**No**	Yes

	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Cost of Capital and Taxes			
Able to separately specify both Federal and State tax rates	Yes	Yes	Yes
Able to specify capital structure percentages	Yes	Yes	Yes
Able to separately specify cost of debt	Yes	Yes	Yes
Able to separately specify cost of equity	Yes	Yes	Yes
Utilization Factors			
Able to specify utilization factors	Yes	Yes	Yes
Able to separately specify feeder and distribution	Yes	Yes	**No**
Able to separately specify customer premises termination facilities	**Yes**	No	No
Able to separately specify fiber electronics	Yes	Yes	Yes
Able to separately specify switching	Yes	Yes	Yes
Summary	**128 Yes** **5 No**	**64 Yes** **69 No**	**72 Yes** **61 No**

Comparison of Cost Model Outputs
ARMIS Investments and Expenses
Southwestern Bell (Texas)

Overall Service Area
by ARMIS 43-03 account number

Plant Specific	Account Number	Southwestern Bell (Texas) Gross	Southwestern Bell (Texas) Net	Telecom Economic Cost Model	Benchmark Cost Proxy Model (BCPM)	Hatfield Model v. 3.0
Total Investment		10,469,881,417	5,419,331,065	8,238,713,687	11,529,744,234	7,467,116,078
Central Office Switching	2210	2,233,376,173	1,169,566,843	2,066,871,237	2,245,383,327	868,211,223
Central Office Transmission	2230	1,741,981,210	973,000,915	2,814,280,591	2,080,699,427	1,504,464,207
Poles	2411			143,515,856	105,150,941	399,504,359
Aerial Cable	2421			436,367,225	151,950,951	672,114,615
Underground Cable	2422			120,477,001	1,819,710,423	1,368,898,778
Buried Cable	2423			2,112,322,935	3,402,317,469	2,448,669,775
Conduit Systems	2441			544,878,842	1,724,531,696	205,253,121
Total Cable and Wire Facilities	2410	6,494,524,034	3,276,763,307	3,357,561,860	7,203,661,480	5,094,440,648
Annual Expenses		242,963,138	242,963,138	560,174,265	391,711,177	-
Central Office Switching	6210	126,588,646	126,588,646	154,325,610	39,994,535	
Central Office Transmission	6230	28,997,492	28,997,492	148,683,628	27,172,757	
Poles	6411			5,740,634		
Aerial Cable	6421			39,189,415		
Underground Cable	6422			8,908,792		
Buried Cable	6423			189,704,215		
Conduit Systems	6441			13,621,971		
Total Cable and Wire Facilities	6410	87,377,000	87,377,000	257,165,027	324,543,885	

Notes: The Telecom Economic Cost Model includes the following components in the various categories.

Central Office Switching	Central Office Switching and Main Distribution Frame
Central Office Transmission	Fiber Electronics and Trunking
Aerial Cable	Copper and Fiber Cable, Customer Premises Termination and Cross-Connects
Underground Cable	Copper and Fiber Cable and Cross-Connects
Buried Cable	Copper and Fiber Cable, Customer Premises Termination, Cross-Connects and Trenching